

UNITED STATES OF AMERICA

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, MALBEE B. SIRJOO of 715 Saginaw
Parkway, Cambridge, Ontario, Canada, N1T 1V9, Canadian Citizen, have invented
certain new and useful improvements in

PORTABLE FOLDING CHAIR, of which the following is a
specification:-

BACKGROUND OF THE INVENTION

FIELD OF INVENTION

This invention relates to a chair having a seat and a backrest where the backrest is movable between upright position and a compact position.

- 5 More particularly, the chair provides back support in situations where a user would otherwise be sitting on a horizontal surface without back support.

DESCRIPTION OF THE PRIOR ART

- It is known to have chairs without legs having a seat and a backrest where the position of the backrest is adjustable relative to the seat. The
10 backrest moves between an upright position and a folded position relative to the seat. The floor seat is bulky, the backrest doesn't have a cushion and the backrest is not very secure in an upright position.

- A floor seat is described in U.S. Patent No. 2685326 issued on August 3, 1954. When moving from an unfolded position to a folded position, the
15 backrest folds forward until a front surface of the backrest lies on an upper surface of the seat.

- Previous chairs without legs are expensive to manufacture, are too heavy to be easily carried by a user, are too cumbersome even when folded, are unstable as they can tip too easily, are too uncomfortable for use over a
20 long period of time or cannot be used as a chair when they are in a folded position.

SUMMARY OF THE INVENTION

- It is an object of the present invention to provide a portable folding chair that can be used as a chair in a compact position and in an upright
25 position. It is a further object of the present invention to provide a portable folding chair that can be moved from an upright position to a compact position in which a backrest lies in the same plane as a seat.

- A chair has a seat and a backrest, the seat having an upper surface and a lower surface, the backrest having a front surface and a rear surface.
30 The chair is readily movable between an upright position and a compact position. In an upright position, the backrest is mounted in a fixed position

relative to the seat so that an angle between the upper surface of the seat and the front surface of the backrest is greater than substantially 90°. In the compact position, the angle is much greater than 90° and the seat and the backrest lie substantially in the same plane.

5 Preferably, in a compact position, the angle between the upper surface of the seat and the front surface of the backrest is substantially 180°.

A chair has a seat and a backrest. The backrest has an inverted U shape with two legs extending downward from a central portion. Each of the legs has a free end that is slidably connected to either side of the seat, the
10 legs straddling the seat. The backrest lies outside of the seat immediately to the rear and sides thereof when the chair is in a compact position. The backrest is at an angle that is greater than substantially 90° when the chair is in an upright position.

 Preferably, a pneumatic cylinder extends directly or indirectly
15 between a seat and the free end of each of the legs.

A method of moving a chair between a compact position and an upright position uses a chair having a seat and a backrest. The seat has an upper surface and a lower surface, the backrest having a front surface and a rear surface. The seat and backrest are in contact with one another. The
20 method comprises, commencing with the chair in a compact position and the seat and the backrest lying substantially in the same plane, pulling the backrest upward and rearward relative to the seat, manipulating the backrest to lock the backrest in an upright position relative to the seat, subsequently manipulating the backrest to unlock the backrest from the upright position,
25 moving the backrest downward and forward to return the chair to the compact position.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a chair in an upright position;

Figure 2 is a top view of a frame for the seat;

30 Figure 3 is a top view of a frame for the backrest;

Figure 4 is a side view of a bracket;

Figure 5 is a side view of the chair in a compact position;

Figure 6 is a side view of the chair in an upright position;

In Figure 7, there is shown a top view of the chair in a compact position;

5 Figure 8 is a front view of the chair in an upright position;

Figure 9 is a perspective view of a further embodiment of a chair in an upright position;

Figure 10 is a side view of a bracket for the chair Figure 9;

10 Figure 11 is a top view of the chair shown in Figure 9 with the cushions removed; and

Figure 12 is a schematic sectional view through the line A-A of Figure 11 with the cushion replaced.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

In Figure 1, a chair 2 has a seat 4 and backrest 6. The seat 4 has
15 frame 8 with a cushion 10 thereon. Along each side of the seat 4, there is mounted a bracket 12. The backrest 6 has a frame 14 with a cushion 16 mounted on an upper portion thereof. The backrest 6 is mounted in contact with the seat 4. As can best be seen from Figure 3, the frame 14 has two legs
20 18, 20 extending downward from a central portion 21 with a connector 22 extending inward from a free end 23 each of the legs 18, 20. The frame 14 has the shape of an inverted U. A handle 24 is mounted on an outer surface of each of the legs 18, 20. There are two braces 26 that are pivotally
25 mounted at each end of the brace between each leg 18, 20 of the frame 14 of the backrest 6 and each side of the frame 8 of the seat 4 to a rear of said backrest. The connectors 22 are tiny posts with an enlarged inner end 28. The posts 22 slide within a slot 30 of each of the brackets 12 on either side of the seat 4 respectively. The braces 26 provide support for the backrest 6 when it is in an upright position as shown in Figure 1. At each corner of the
30 seat 4, there is located a small pedestal 32 (only one of which is shown in Figure 1). The pedestals 32 raise the seat 4 slightly above any supporting

surface (not shown) on which the chair 2 is viewed. In Figure 2, there is shown a top view of the frame 8 of the seat 4.

In Figure 4, there is shown a side view of one of the brackets 12. The brackets 12 on either side of the chair 2 are mirror images of one another. There are two openings 32 in each of the brackets 12 and the brackets are affixed to the frame 8 of the seat 4 by screws (not shown). The slot 30 is an elongated slot that slopes upward toward a front of the chair 4. The slot 30 has two inverted L-shaped notches 34, 36 extending upward therefrom. In the upright position shown in Figure 1, the backrest 6 is pivotally mounted within the notches 34 via the connectors 22.

In Figure 5, the chair 2 is shown in a compact position. The same reference numerals are used in Figure 5 to describe those components that are identical to the components shown in Figure 1. It can be seen that there is a pedestal 32 located at each of the upper corners of the backrest 6. In the compact position, the seat 4 and backrest 6 lie in the same plane.

In Figure 6, there is shown a top view of the chair 2 in the compact position. The same reference numerals are used in Figure 6 as those used in Figures 1 and 5 for those components that are identical.

In Figure 7, there is shown a side view of the chair 2 in the first upright position, being the same upright position as that shown in Figure 1. The same reference numerals are used in Figure 7 as those used in Figures 1 and 5 to describe those components that are identical. The chair 2 has a second upright position which is shown in Figure 7 by dotted lines. In the first upright position, the connectors 22 are pivoted in the notches 34 and in the second upright position, the connectors 22 are pivoted in the notches 36. The notch 34 is not shown in Figure 7 as it is hidden by the side 18 of the backrest 6. Only one of the notches 36 is shown in Figure 7.

In Figure 8, there is shown a front view of the chair 2 in the first upright position shown in Figures 1 and 7. The same reference numerals are used in Figure 8 as those used in Figures 1 and 7 to describe those components that are identical.

By comparing Figures 2 and 3 with Figures 5 and 6, it can be seen that when the chair is in a compact position, the frame 14 is aligned with and immediately adjacent to an exterior of a rear member 31 and sides of the frame 8 of the seat 4. The cushion 16 fills the gap that would otherwise exist between a rear 31 of the frame 8 and the cushion 10 of the seat 4 when the chair 2 is in the compact position.

The compact position is the carrying or transporting position of the chair 2. However, even in the compact position, the chair 2 has an advantage over previous chairs in that the cushions 10, 16 of the seat 4 and backrest 16 are oriented side by side in substantially the same plane. An angle between an upper surface 38 of the cushion 10 of the seat 4 and an upper surface 40 of the cushion 16 of the backrest 6 are at an angle of substantially 180° relative to one another. In the first upright position shown in Figure 7, the angle of the upper surface 38 to the front surface 40 is greater than 90° and is substantially 100° . In the second upright position shown in Figure 7 by way of dotted lines, the angle is substantially 125° . If desired, the chair could have upright positions at different angles than those shown simply by relocating the notches on the brackets 12. Further, more than two upright positions could be utilized by locating more than two notches in the brackets 12.

In operation, to move the chair from the compact position shown in Figure 5 to each of the two upright positions shown in Figure 7, the backrest is pulled rearward and upward relative to the seat. The connectors 22 slide along the slot 30 until the connectors can be guided into the notch 34. When the connectors are located properly within the notch 34, the backrest is locked in the first upright position. To move out of the first upright position, the handles 24 are pulled backward slightly and the connectors are manipulated out of the notch 34. From that position, the backrest can be pivoted toward the rear and the connectors can slide toward the compact end of the bracket 12 to return the chair to the compact position. Alternatively,

after the connectors have been removed from the slot 34, the handles can be pulled to move to connectors into the slot 36. When the connectors are properly located within the slot 36, the backrest will be locked in the second upright position. As can readily be seen from Figure 7, the backrest leans further back in the second upright position than it does in the first upright position. To move the backrest out of the second upright position, the handles 24 are forced slightly rearward until the connectors are back in the main part of the two slots 30. The chair can then be moved either to the first upright position or back to the compact position.

10 In Figures 9 to 12, there is shown a further embodiment of a chair 50 that is operable by a pneumatic cylinder 52 located between the seat 4 and backrest 6. The same reference numerals are used in Figures 9 to 12 as those used in Figures 1 to 8 for those components that are identical. Figure 9 is a perspective view of the chair 50 with the pneumatic cylinder 52 shown by
15 dotted lines. Figure 10 is a side view of a bracket 54 having a slot 56 that slopes upward toward the front 4 of the chair 50. In Figure 11, it can be seen that the cylinder 52 has an activator 58 protruding from a front of the frame 8 of the seat 4. The cylinder 52 spins between the front of the frame 8 of the seat 4 and a cross member 60. The cross member 60 is slidable above the
20 frame 8 and beneath the cushion 10. A space is created between the frame 4 and the cushion 10 by four posts 62, which are best seen in Figure 12. Only two of the four posts 62 are shown in Figure 12. The posts 62 are located outside the moveable range of the cross member 60. The cross member 60 has two projections 64, one projection 64 being located at each end of the
25 cross member. The projections 64 extend through the slot 56 on each of the brackets 54 on either side of the chair 52. The free end of the legs 18, 20 are affixed to the projections 64 so that the backrest straddles the frame 8 in the compact position (not shown in Figures 9 to 12). The frame 8 has longitudinal guides 66 extending from front to rear which interact with
30 L-shaped hooks 68 extending downward from the cross member 60. The hooks 68 and longitudinal guides 66 keep the cross member aligned with the

frame 8. The pneumatic cylinder 52 has an extended position as shown in Figures 9 and 11 and a retracted position (not shown). In the extended position shown, the chair is in an upright position. In the retracted position, the cross member will be moved toward the front of the seat 4, thereby
5 pulling the legs 18, 20 toward the front of the slot 56 and moving the backrest into the compact position. The compact position is not shown for the chair 52, but is essentially the same as the compact position shown for the chair 2 in Figures 5 and 6. The only real difference is that the cushion 10 must be raised slightly above the frame 8 as previously stated to allow space
10 for the cross member to move. Since the cylinder 52 has various extended positions, the angle of the backrest relative to the seat can be adjusted to the comfort of the user and readjusted, if desired. Preferably, the cylinder is designed to move to the extended position when the activator 58 is pushed to one side if there is no external force placed on the backrest. Further, the
15 cylinder 52 is designed to retract when the activator 58 is pushed to one side an external force downward on the backrest. When moving the chair to a compacted position from an upright position, the activator 52 is moved to one side and the backrest is simultaneously manually pushed downward until the compact position has been attained. The cushions 10 have been removed
20 in Figure 11 to expose the frame 8.

The chair of the present invention has several advantages. The backrest moves from the upright position to the compact position by pivoting the backrest further rearward away from the upper surface 38 of the cushion 10. If the backrest were moved to the compact position by pivoting the
25 backrest forward, the chair would be at least twice as thick in the folded position than it is in the compact position shown in Figure 5. Also, even though the cushion 16 lies side by side with the cushion 10 in the compact position, the length of the chair from front to rear in the compact position is only about 25% greater than the length of the chair from front to rear when
30 the chair is in an upright position.

When the chair is in the first upright position, the pivot point of the backrest relative to the seat is at the notch 34. The distance from the notch 34 to the rear 31 of the frame 8 adds stability to the chair and greatly increases the difficulty of tipping the chair over backward. In the second
5 upright position, the backrest is pivoted at the notch 36 relative to the seat 4. In this position, even though the centre of gravity of a user of the chair is moved more toward the rear because the backrest is tilted back further, the greater distance of the notch 36 to the rear member 31 results in the chair being extremely stable.

10 While the chair of the present invention is designed to make "sitting on the floor" much more comfortable to a user, the chair could also be used on flat surfaces to provide back support. If one sits on the floor, without back support, the sitting position soon becomes extremely uncomfortable. With the chair of the present invention, one can sit on the chair, while the
15 chair rests on the floor, relatively comfortably for a much longer period of time. The chair of the present invention is portable and can easily be moved from one location to another and can easily be carried by a user for long distances.